

CROWELL & MORING

1001 PENNSYLVANIA AVENUE, N.W.

WASHINGTON, D.C. 20004-2595

(202) 624-2500

CABLE: CROMOR

FACSIMILE (RAPICOM): 202-628-5116

W. U. I. (INTERNATIONAL) 64344

W. U. (DOMESTIC) 89-2448

SUITE 1200

2010 MAIN STREET

IRVINE, CALIFORNIA 92714-7217

(714) 263-8400

FACSIMILE (714) 263-8414

DENNING HOUSE

90 CHANCERY LANE

LONDON WC2A 1ED

44-71-413-0011

FACSIMILE 44-71-413-0333

May 5, 1994

BY HAND DELIVERY

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, D.C. 20554

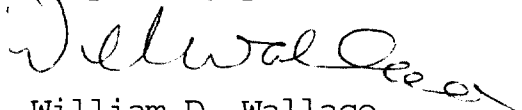
RE: In the Matter of Amendment of the Commission's
Rules to Establish Rules and Policies Pertaining
to a Mobile Satellite Service in the 1610-
1626.5 MHz and 2483.5-2500 MHz Frequency Bands
CC Docket No. 92-166

Dear Mr. Caton:

Transmitted herewith for filing with the Commission on
behalf of Loral/QUALCOMM Partnership, L.P., are an original and
four copies of its "Comments."

Should there be any questions regarding this matter, please
communicate with this office.

Very truly yours,


William D. Wallace

Enclosures

ORIGINAL

Before The
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)
)
Amendment of the Commission's)
Rules to Establish Rules and)
Policies Pertaining to a Mobile)
Satellite Service in the 1610-)
1626.5 MHz and 2483.5-2500 MHz)
Frequency Bands)
_____)

CC Docket No. 92-166

RECEIVED

MAY - 5 1994

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

COMMENTS OF
LORAL/QUALCOMM PARTNERSHIP, L.P.

John T. Scott, III
William D. Wallace
CROWELL & MORING
1001 Pennsylvania Ave., N.W.
Washington, DC 20004
(202) 624-2500

Leslie A. Taylor
LESLIE TAYLOR ASSOCIATES
6800 Carlynn Ave.
Bethesda, MD 20817
(301) 229-9341

Attorneys for Loral/QUALCOMM
Partnership, L.P.

Dated: May 5, 1994

Before The
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)	
)	
Amendment of the Commission's)	
Rules to Establish Rules and)	CC Docket No. 92-166
Policies Pertaining to a Mobile)	
Satellite Service in the 1610-)	
1626.5 MHz and 2483.5-2500 MHz)	
Frequency Bands)	
<hr/>		

COMMENTS OF
LORAL/QUALCOMM PARTNERSHIP, L.P.

John T. Scott, III
William D. Wallace
CROWELL & MORING
1001 Pennsylvania Ave., N.W.
Washington, DC 20004
(202) 624-2500

Leslie A. Taylor
LESLIE TAYLOR ASSOCIATES
6800 Carlynn Ave.
Bethesda, MD 20817
(301) 229-9341

Attorneys for Loral/QUALCOMM
Partnership, L.P.

Dated: May 5, 1994

TABLE OF CONTENTS

	<u>Page</u>
I. INTRODUCTION AND SUMMARY OF COMMENTS	2
A. Introduction	2
B. Summary of Comments	4
II. LQP SUPPORTS THE PROPOSED ELIGIBILITY REQUIREMENTS FOR MSS	10
A. MSS Above 1 GHz Should Be Restricted to LEO Systems	11
1. LEO Systems Offer Technical and Service Benefits	11
2. Expansion of Spectrum for GSO MSS Is Not Warranted Under Existing Commission Policy Promoting New Entrants and Protecting Against Spectrum Warehousing	15
B. LQP Supports Coverage Standards for MSS Above 1 GHz	19
1. Global	19
2. 50-State Coverage	20
C. A Spectrum Efficiency Standard Would Improve MSS	22
D. The Commission Should Apply the Domestic Fixed-Satellite Financial Qualification Standard	24
E. Restrictions on Licensee Eligibility Are Lawful	28
III. THE COMMISSION'S SPECTRUM SHARING PROPOSAL PROVIDES A WORKABLE FRAMEWORK, BUT REQUIRES MODIFICATION IN ORDER TO BECOME AN ACCEPTABLE PLAN FOR LICENSING LEO MSS SYSTEMS	29
A. The Proposed CDMA-TDMA Spectrum Division Is Workable	30

B.	CDMA Systems Must Have Access to the Entire S-Band	32
1.	There Are Multiple Technical Requirements For Full Availability of the S-Band to CDMA Systems	32
2.	There Is No Legal Basis For Limiting Full Availability Of the S-Band to CDMA Systems	33
C.	CDMA Spectrum Should Not Be Reduced and Reassigned	36
D.	The Commission Must Require U.S. MSS Systems to Commence Intersystem Coordination Immediately	41
IV.	ADOPTION OF A PROPERLY CRAFTED CDMA/TDMA SPECTRUM-SHARING PROPOSAL TO AWARD MSS ABOVE 1 GHZ LICENSES IS PREFERABLE TO COMPARATIVE HEARINGS, AUCTIONS OR LOTTERIES	45
A.	The Proposed Spectrum Sharing Solution Achieves Critical Principles for Spectrum Sharing	45
B.	Use of Comparative Hearings Would Delay Rather Than Expedite Licensing Contrary to the Public Interest	49
C.	Spectrum Auctions Would Not Serve the Public Interest	50
1.	Budget Act Considerations	50
2.	International Considerations	52
3.	Public Interest Considerations	53
4.	Feederlinks	54
5.	Auction Format	55
D.	Use of Lotteries for MSS Above 1 GHz Would Be Contrary to Congressional Directive, Prior Commission Actions, and the Public Interest	56

VI.	THE COMMISSION SHOULD ADOPT SPECIFIC COORDINATION REQUIREMENTS FOR THE RDSS/MSS APPLICANTS	60
VII.	THE COMMISSION MUST REVISE THE PROPOSED RULES FOR INTERSERVICE SHARING TO FACILITATE MSS OPERATIONS	62
A.	The Commission Should Make Minor Modifications To Its Proposed Protection Zone Requirements for Radioastronomy Operations	63
B.	The Emission Limits of Proposed Section 25.213(b) Should Be Limited to GPS Operations	65
C.	The Commission Should Adopt Rules Regarding GLONASS Which Promote MSS and Do Not Require Protection of GLONASS Operations in Frequencies above 1606 MHz	66
D.	The Commission Can Increase the PFD Limit in the 2483.5-2500 MHz Bands In Order to Enable CDMA LEO MSS Systems to Achieve Capacity Objectives Without Causing Harmful Interference to the Fixed Service	73
1.	To Achieve the Maximum Benefit of the New MSS Services, the PFD Levels Must Be Increased	75
2.	To Allow Efficient and Effective Coordination, Footnote 753F Should Be Designated a "Trigger" .	77
E.	ITFS/MMDS Systems Operating Above 2500 MHz will Not Cause Harmful Interference into CDMA LEO MSS Operations in the 2483.5-2500 MHz Band	78
F.	LEO MSS Systems Operating in the 2483.5-2500 MHz Band Will Not Receive Harmful Interference from ISM Equipment Operating at 2450 +/- 50 MHz	80

G.	LEO MSS System Can Protect Fixed- Service Systems Operating Under RR 730 and RR 732	83
VIII.	THE COMMISSION MUST MAKE FEEDER LINKS BELOW 15 GHZ AVAILABLE FOR MSS SYSTEMS. . . .	83
A.	The Commission Can Utilize FSS Frequencies in the Reverse-Band Mode for LEO MSS Feeder Links	86
B.	The Commission Should Permit Utilization of the 5000-5250 MHz Band for MSS Feeder Uplinks and Encourage Agreement by the Executive Branch For Its Use	88
C.	The Commission Should Assign Spectrum within the 6425-7075 MHz Band for LQP Feeder Downlink	90
D.	MSS Feeder links Could Also be Located in Other Frequency Bands Allocated to the FSS	91
E.	Globalstar Feederlinks Would Not Cause Harmful Interference Into Terrestrial Services	92
F.	Use of Reverse-Band Working Eliminates LEO/GSO Sharing Concerns	93
G.	The Commission Should Not Attempt to Place all the LEO MSS Feeder Links in the 20/30 GHz Band	94
H.	The Commission Has Proposed an Appropriate Approach to RR 2613	96
IX.	THE COMMISSION SHOULD LICENSE MSS LEO OPERATORS AS PRIVATE MOBILE RADIO SERVICE PROVIDERS AND NON-COMMON CARRIERS	96
X.	THE TERMS OF THE MSS SYSTEM LICENSE SHOULD PROVIDE BLANKET AUTHORITY TO LAUNCH THE NUMBER OF SATELLITES NEEDED TO COMPLETE A CONSTELLATION AND PROVIDE SPARES	101

A.	The Commission Should Grant a Blanket Authorization for a Constellation of Operating LEO Satellites	102
B.	Spare Satellites Should Be Allowed to Operate	104
C.	The Commission Should Clarify the Conditions on Modifying LEO Satellite Design	105
XI.	THE PROPOSED IMPLEMENTATION MILESTONE AND SYSTEM REPLACEMENT RULES FOR MSS ABOVE 1 GHZ SHOULD BE REVISED TO REFLECT THE REALITIES OF SATELLITE CONSTRUCTION AND LAUNCH SCHEDULES	106
A.	Implementation Milestones and Eligibility Requirements Must Be Made To Dovetail In A Consistent Manner	109
XII.	LQP SUPPORTS IN PRINCIPLE THE PROPOSED REQUIREMENTS FOR ANNUAL REPORTS AND DISTRESS AND SAFETY COMMUNICATIONS	115
XIII.	LQP WILL WORK WITH THE COMMISSION TO COORDINATE THE GLOBALSTAR SYSTEM INTERNATIONALLY	117
XIV.	THE FCC MUST REQUIRE CURRENT USERS OF THE 1610-1626.5 MHZ BAND TO CEASE TRANSMISSIONS UPON THE INITIAL LAUNCH OF THE BIG LEO MSS SYSTEMS	118
XV.	CONCLUSION	120

Before The
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)
)
Amendment of the Commission's)
Rules to Establish Rules and) CC Docket No. 92-166
Policies Pertaining to a Mobile)
Satellite Service in the 1610-)
1626.5 MHz and 2483.5-2500 MHz)
Frequency Bands)
_____)

To: The Commission

COMMENTS OF
LORAL/QUALCOMM PARTNERSHIP, L.P.

Loral/QUALCOMM Partnership, L.P. (LQP), hereby responds to the Commission's Notice of Proposed Rule Making, FCC 94-11 (released Feb. 18, 1994) (NPRM). LQP is an applicant to construct Globalstar, a global, low-earth orbit satellite telecommunications system (File Nos. 19-DSS-P-91(48) and CSS-91-014),¹ and has participated throughout the Commission's proceedings in this docket and the related spectrum allocation proceeding in ET Docket No. 92-28.²

¹ As a result of a restructuring of the applicant on March 23, 1994, LQP succeeded to the interest of Loral Qualcomm Satellite Services, Inc., in the Globalstar application. See Amendment to Globalstar System Application (filed Apr. 21, 1994).

² See Comments (filed Dec. 4, 1992); Reply Comments (filed Jan. 6, 1993); Petition for Clarification and Partial Reconsideration (filed Mar. 30, 1994). LQP was also an active participant in the MSS Above 1 GHz Negotiated Rulemaking Committee established in CC Docket No. 92-166. See Report of the MSS Above 1 GHz Negotiated Rulemaking Committee, App. 2 (Apr. 6, 1993) (NRC Report).

I. INTRODUCTION AND SUMMARY OF COMMENTS

A. Introduction

As the Commission recognizes (NPRM, ¶ 2), low-earth orbiting satellite MSS systems have the potential to provide "almost limitless" mobile telecommunication services at low cost. These systems can meet the demand in the United States "for a seamless, nationwide communications system that is available to all" as well as providing in rural areas "immediate access to a feature-rich communications network." Id. These same benefits can be extended internationally due to the global coverage of LEO constellations, and, in those countries without communications networks, LEO MSS systems can provide an "'instant' global telecommunications infrastructure at minimal cost." NPRM, ¶ 2.

With its initial financing in place³ and construction on the GLOBALSTAR satellite constellation ready to begin,⁴ LQP is poised to implement the Commission's service objectives. Through GLOBALSTAR, LQP will provide new and enhanced mobile-satellite services in the United States, including low-cost voice, data, facsimile and position location services to and from hand-held transceivers and other portable and fixed terminals. As an

³ On March 24, 1994, Loral Corporation announced that eight major international telecommunications companies were joining Loral Corporation and QUALCOMM Incorporated as strategic partners in development of GLOBALSTAR, and were initially investing \$275 million in the global system.

⁴ See LQP Request for Waiver of Section 319(d) (filed Mar. 30, 1994).

international satellite system, GLOBALSTAR will provide these same services on a global basis as well as international roaming services for subscribers to GLOBALSTAR and terrestrial wireless systems in the United States and abroad.

However, none of the proposed MSS systems can be implemented in the United States and none of these service benefits can be attained until the Commission has adopted licensing policies and rules for LEO MSS. Accordingly, to achieve the Commission's service goals and the important public interest benefits identified in the NPRM, LQP strongly urges the Commission to act expeditiously on the proposed rules and policies for licensing MSS Above 1 GHz systems.

LQP believes that a speedy resolution is achievable. The proposed rules and policies represent a substantial and promising step toward making the Commission's goals a reality. Indeed, with certain modifications to the proposed rules, as specified herein, licensing GLOBALSTAR (and other eligible, qualified systems) for LEO-delivered MSS could occur in the very near future.

To respond to the Commission's suggestions with respect to reaching a resolution in this proceeding, and to promote speedy action so that service to the public can be initiated, LQP has repeatedly met with principals, engineers, and counsel for the other LEO applicants in this proceeding. These meetings have been designed to explore the technical, legal and other issues which divide the LEO applicants so that solutions to them can be

framed, refined, and ultimately adopted. The most recent engineering meeting, held in mid-April, yielded significant and encouraging advances in understanding the issues posed by GLONASS operations. The principles and approach discussed at that time are being pursued; further research and meetings are anticipated.

LQP believes that these discussions have resulted in progress toward mutually agreeable resolutions on technical issues. LQP intends to continue to discuss the full range of legal, technical and other issues with other applicants to do all it can to formulate approaches which will lead to a prompt conclusion of this docket and expeditious commencement of service.

B. Summary of Comments

These comments outline LQP's recommendations with regard to each of the proposals in the NPRM. A substantial Technical Appendix is attached in support of specific engineering recommendations. LQP is also continuing to work to develop information which will be of assistance to the Commission in setting rules and policies for MSS.

1. Spectrum Sharing.

With respect to the specific proposals in the NPRM, LQP believes that the Commission has set forth a potentially workable solution to the issue of intraservice sharing in the 1610-1626.5 MHz uplink frequencies. While resolution of this issue has

divided the applicants for some time, LQP believes that the Commission's proposal to split the band in 11.35 MHz and 5.15 MHz segments for CDMA and TDMA, respectively, presents a potentially reasonable accommodation of competing interests.

However, the Commission's proposed spectrum-sharing plan can be made to work to develop MSS only if the Commission retains the general approach to MSS eligibility outlined in the NPRM and makes certain specific modifications to the plan, as discussed below, to facilitate use of the spectrum by MSS LEO systems.

First, the Commission must assign the entire 16.5 MHz of S-band spectrum for MSS downlinks. See NPRM, ¶ 37. The Commission has incorrectly assumed that the CDMA applicants need only an amount of spectrum in S-band corresponding to that in L-band. In fact, the L-band and S-band frequencies are not technically equivalent, and reservation by the Commission of any portion of frequencies in S-band would impair the ability of MSS systems to provide service and to achieve capacity objectives without providing any benefit to terrestrial services operating in or adjacent to the band.

Second, the Commission should not require MSS systems to protect GLONASS receivers as part of GNSS above 1606 MHz. See NPRM, ¶¶ 54-57. By January 1, 1999, GLONASS should be operating on a revised frequency plan at or below 1606 MHz. Analysis included in these comments demonstrates that protection of potential users above 1606 MHz is not required or desirable. Out-of-band protection for GLONASS transmissions below 1606 MHz

will enable sufficient numbers of GLONASS satellites to be utilized in a GPS/GLONASS Global Navigation Satellite System (GNSS). In any event, the United States should support MSS system operations throughout the 1610-1626.5 MHz band by adopting the -15 dBW/4kHz limit for uplink EIRP. Accordingly, there is no need to impose stringent requirements on new MSS systems for the protection of GLONASS in the 1610-1616 MHz band and no need to adopt an "interim" or "transition" plan for MSS licensees pending implementation of the revised GLONASS frequency plan.

Third, the Commission's band-segmentation plan cannot include an automatic reduction from 11.35 MHz to 8.25 MHz for the CDMA segment if only one CDMA system becomes operational. NPRM, ¶ 33. This proposal is based on a misconception that TDMA and CDMA technologies use the spectrum in an equivalent manner such that simply dividing the allocated spectrum by two is technically justifiable. As the Commission notes, 5.15 MHz is sufficient spectrum for the TDMA system to "successfully operate" without ceding an additional 3.1 MHz from the CDMA segment. Moreover, stringent in- and out-of-band protection criteria are imposed on CDMA systems operating in 1610.6-1613.8 MHz to protect radioastronomy observations, and potentially, in 1610-1616 MHz, to protect aeronautical radionavigation systems, thereby already reducing the availability of MSS spectrum for CDMA systems. Therefore, no reduction in CDMA spectrum is technically feasible. Such a reduction would also arbitrarily penalize and discriminate against CDMA systems, potentially lead to warehoused or fallow

spectrum, and undermine the Commission's goals in this proceeding.

Fourth, for the Commission's proposals to become workable, it must promptly specify feederlinks for MSS systems. The Commission asked applicants in the NPRM to provide proposals for feederlinks below 15 MHz. NPRM, ¶ 77. In these comments, LQP demonstrates the availability of feederlinks in C-band for MSS operations, and the deficiencies of using feederlinks in Ka-band assigned to fixed-satellite service. The Commission should support LQP's proposal for C-band feederlinks in this proceeding and at future international fora.

In addition to these four essential modifications (and retaining the eligibility criteria set forth in the NPRM), there are other modifications to the Commission's proposed rules and policies for MSS Above 1 GHz which must be made.

2. Eligibility Rules.

With respect to the Commission's proposed eligibility requirements for MSS, LQP recommends that the Commission adhere to stringent standards. The 1.6/2.4 MHz bands should, as the Commission proposed, be reserved for LEO systems to ensure that new technologies and services offered by LEO MSS systems are made available to the public. The Commission's proposed global and U.S. coverage standards, with minor adjustments, are appropriate requirements for this service. The proposed use of the Domestic Fixed-Satellite Service financial standard is a critical element

in ensuring that the available spectrum does not lie fallow and that properly financed licensees have the opportunity to put the spectrum to use. Moreover, adoption of a channel efficiency standard would facilitate MSS operations in the band and provide a backstop for the Commission's proposed financial qualifications and implementation milestones.

3. Regulatory Classification.

The Commission's other regulatory proposals for MSS are, for the most part, on target. LQP supports the approach of treating MSS system operators who do not serve end users directly as non-common carriers. The public interest would be served by designating provision of MSS space segment as a private mobile radio service, rather than a commercial mobile radio service. Such a distinction would be consistent with the Commission's prior practice, the language of Section 332 of the Act, and Congressional intent in its adoption.

4. Licensing and Milestones.

LQP has recommended minor adjustments in several of the system licensing and implementation milestone rules (apparently modelled after those adopted in the "Little LEO" proceeding) to make them more applicable to "Big LEO" systems and to facilitate introduction and effective use of the new Big LEO MSS service. Of particular concern are the need to: (1) inject a requirement for demonstrations of actual progress toward launch and operation

into the proposed construction milestones; and (2) provide a more timely procedure for authorizing second-generation, replacement LEO satellites.

5. Interservice sharing.

LQP has provided substantial technical information supporting revisions to L-band rules and providing a basis for assigning the full S-band for use by CDMA MSS LEO systems. LQP demonstrates that MSS systems can coordinate successfully with radioastronomy observatories, GLONASS, and GPS in L-band. Moreover, LQP shows that MSS operations in S-band will not cause harmful interference into nor receive harmful interference from terrestrial fixed services, ITFS and ISM and that PFD limits can and should be raised to enable CDMA systems to achieve capacity objectives.

While certain modifications in the rules are critical to making the Commission's proposals workable and to the success of MSS, the Commission's proposed licensing rules are a substantial and promising step toward prompt implementation of MSS LEO systems. LQP's comments are designed to strengthen further the development of robust MSS systems which can provide enduring service in the public interest and to assist the Commission in bringing its proposals to a successful and prompt conclusion.

II. LQP SUPPORTS THE PROPOSED ELIGIBILITY REQUIREMENTS FOR MSS.

LQP strongly supports the Commission's proposal to adopt rules for MSS Above 1 GHz to ensure that licensees "can expeditiously implement state-of-the-art systems that further the public interest." NPRM, ¶ 18. To achieve this goal, the Commission has proposed specific, carefully-tailored technical and financial requirements for MSS systems. See Proposed 47 C.F.R. § 25.143(b). Such eligibility requirements are necessary to help achieve the Commission's goal of expediting implementation of state-of-the-art systems which can provide robust service to the public. LQP recommends that the Commission adhere to the proposed eligibility requirements to achieve that goal in this proceeding.

With regard to the specific eligibility requirements set forth in proposed Section 25.143(b), LQP supports their adoption with minor modifications.⁵ These modifications are proposed to ensure that the eligibility requirements serve their intended purpose, but at the same time, do not arbitrarily degrade the ability of a system to serve the public by, for example, unnecessarily increasing system costs with no corresponding benefit, and/or inadvertently dictating system design criteria which serve no useful purpose.

⁵ In later sections of these Comments and in the attached Technical Appendix, LQP provides substantial discussion of the interservice sharing requirements proposed in Section 25.213 which addresses the proposed eligibility requirement of Section 25.143(b) (2) (iv) regarding demonstration of interservice sharing.

A. MSS Above 1 GHz Should Be Restricted to LEO Systems.

The Commission should adopt Section 25.143(b)(i), which requires use of LEO constellations for MSS Above 1 GHz.⁶ As the Commission recognizes (NPRM, ¶ 20), the Communications Act directs it "to encourage the provision of new technologies and services to the public." 47 U.S.C. § 157. LEO satellites represent state-of-the-art telecommunications technology, and LEO MSS systems can provide a broad array of services which GSO satellites cannot.⁷ See Report and Order, 9 FCC Rcd 536, 539 (1994) (MSS Allocation Order). The Commission has previously provided spectrum for a GSO system. See MSS Licensing Procedures (Final Decision), 7 FCC Rcd 266 (1992), appeal dismissed sub nom. Aeronautical Radio, Inc. v. FCC, 983 F.2d 275 (D.C. Cir. 1993). Accordingly, to provide for "technical diversity" and to achieve the service, economic and societal benefits and advantages outlined in the NPRM and below, the Commission should adopt the proposed LEO eligibility requirement for MSS Above 1 GHz.

1. LEO Systems Offer Technical and Service Benefits.

LQP agrees with the Commission that there are significant technical and service benefits which LEO systems offer over existing GSO systems, and that these benefits warrant restriction

⁶ The Commission has also proposed to restrict the award of "system licenses" to constellations of non-geostationary satellites. See Proposed Section 25.143(a).

⁷ Throughout these Comments, LQP uses the term "LEO" to apply to all non-geostationary satellites.

of MSS Above 1 GHz to LEO constellations. See NPRM, ¶¶ 20-21; MSS Allocation Order, 9 FCC Rcd at 539.

a. Technical Benefits of LEOs. LEO satellite communications systems offer important technical advantages. Their far lower orbits (GSO: 35,786 km; GLOBALSTAR: 1414 km) permit the use of lower power for transmissions from the mobile earth station to the satellite without the use of extremely large satellite receiving antennas, enabling LEO MSS systems to provide service from and to handheld transceivers. In contrast, users of currently authorized GSO systems, because of their higher power requirements, must carry bulky "suitcase" phones, or rely on vehicle-mounted stations.

Low earth orbit also allows a user to avoid the transmission delay found between earth stations and GSO satellites. Lack of transmission delay improves the interoperability of satellite transmissions with terrestrial networks. Interoperability facilitates use of the public switched network as a complement to LEO MSS systems and improves service. MSS systems, either GSO or LEO, are proposing digital technology for service links. As such, they require digital processing which can add up to 100 ms of delay. For LEO systems, this is added to only 18 ms of path delay. For GSO systems, this is added to the 250 ms of path delay for a total delay of 350 ms. Such delay is likely to be objectional to most potential subscribers.

Further, LEO constellations are inherently global, which enables LEO systems to provide international telecommunications

capacity. In contrast, each GSO satellite is licensed to a specific orbital slot for regional coverage. See, e.g., Land-Mobile Satellite Service, 2 FCC Rcd 485, 486 n.17 (1986) (subsequent history omitted) (potential North American service area for AMSC). There are no global wireless systems currently licensed in the United States. Therefore, requiring LEO systems for MSS Above 1 GHz would ensure that the benefits of global satellite service become available to United States citizens.

b. Service Benefits of LEOs. The technical advantages of LEO systems described above translate directly into service benefits for the public. For example, GLOBALSTAR will provide global, roaming service, which allows users of terrestrial wireless systems to connect with these networks outside their service areas. LQP offers a service area which is not just nationwide, but also worldwide, thereby fulfilling an important mandate to the Commission of the Communications Act of 1934:

to make available, so far as possible, to all the people of the United States a rapid, efficient, Nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges

47 U.S.C. § 151. LEO satellite systems offer the Commission the first opportunity to put into place a commercial "world-wide radio communication service" for the benefit of consumers in the United States and to fill this need with service offerings mandated by the Act. No domestic GSO system has offered comparable service.

GLOBALSTAR can fulfill the urgent need for dependable, ubiquitous communications that arises in the event of natural disasters and other emergencies. The success of any disaster recovery operation depends on reliable telecommunications, but terrestrial networks are themselves vulnerable to such disasters. For example, when a major earthquake struck Los Angeles in January, 1994, wireline and even cellular communications were disrupted; a private satellite operator assisted public agencies in initiating emergency communications via satellite.

Low-earth orbit allows LEO systems to provide coverage to all populated land masses with a single telecommunications network. Whether users are on the slopes of the Rocky Mountains or the streets of Paris, they can carry a single, mobile GLOBALSTAR earth station and hold in their hand the ability to calculate their geographic position, call the office or the babysitter, or receive an emergency call. Again, no single GSO system has ever offered such service.

Two of GLOBALSTAR's principal service segments will furnish mobile service to persons working or residing in areas currently unserved by cellular radio or persons roaming into such areas. Because GLOBALSTAR's service area is international in size, such service can be critical to American diplomats and business persons travelling to other countries. Moreover, because GLOBALSTAR can be used to locate objects, persons and/or cargo, American industry can use GLOBALSTAR to locate shipments, reroute cargo, and confirm deliveries from offices in the United States

throughout the world. No GSO system offers such universal service capability.

In short, as the Commission recognized, "a LEO-only design requirement should provide U.S. customers with maximum access to a new, alternative voice-MSS technology, to the benefit of the public." NPRM, ¶ 20.

2. Expansion of Spectrum for GSO MSS Is Not Warranted Under Existing Commission Policy Promoting New Entrants and Protecting Against Spectrum Warehousing.

The Commission recognized in the NPRM that it has already authorized MSS through a GSO system. NPRM, ¶ 20. Because the existing GSO system has not yet launched its authorized satellites, it is not entitled to assignment of spectrum for system expansion. Moreover, as the Commission recognizes, there are substantial public interest benefits from promoting the new LEO system industry. NPRM, ¶ 21.

a. Preclusion of GSO Expansion. The Commission's existing policies in the Domestic Fixed-Satellite Service (DOMSAT) require that the Commission reject the attempt of AMSC (the only proposed GSO system in this processing group) to expand the spectrum assigned for GSO systems. AMSC has already been authorized to construct, launch and operate three geostationary satellites at specified orbital slots. See MSS Tentative Decision, 6 FCC Rcd 4900, aff'd, MSS Final Decision, 7 FCC Rcd 266 (1992), appeal disms'd sub nom. Aeronautical Radio, Inc. v. FCC, 983 F.2d 275

(D.C. Cir. 1993). Despite a launch milestone date of July 1993,⁸ none of AMSC's satellites has been launched. Indeed, AMSC recently sought an extension of the milestones for its second and third satellites using MSS spectrum, authorized five years ago in a separate proceeding, to await Commission action in this proceeding. See Application File Nos. 13-DSS-AMEND-94 and 14-DSS-AMEND-94 (filed Feb. 2, 1994).

Under the Commission's existing DOMSAT policies, AMSC should be precluded from expanding its system into the spectrum allocated for MSS Above 1 GHz. Because it holds an authorization for three unlaunched satellites, the request by AMSC for expansion of its system should be denied. See Domestic Fixed-Satellite Service, 1 FCC Rcd 682, 685 (1986) (application of licensee of three authorized but unlaunched satellites for an additional orbital assignment would be denied). The Commission applies this policy for "balance between providing operators with planning certainty for expansion capacity and the need to prevent applicants from warehousing orbital assignments and blocking new entry by qualified companies at a later date."⁹ Id.

⁸ See MSS Final Decision, 7 FCC Rcd 266, 274-75 (1992) (incorporating launch milestone dates set forth in MSS Memorandum Opinion, Order and Authorization, 4 FCC Rcd 6041, 6060 (1989)) (subsequent history omitted).

⁹ Similarly, "speculative showings of the need for expansion capacity" do not satisfy the Commission's DOMSAT requirements. See DOMSAT, 1 FCC Rcd at 685. AMSC here has not presented evidence of need for expansion into the 1.6/2.4 MHz band. See LOSS Petition to Deny Application of AMSC Subsidiary Corporation, at 24-29 (filed Dec. 18, 1991).

The Commission should apply the principles underlying this policy here to prevent AMSC -- the only authorized MSS system -- from warehousing spectrum and attempting to block entry of competitive MSS systems. The Commission has long and consistently favored vigorous competition in the satellite communications area. See International Satellite Systems, 61 RR 2d 649, 655 ¶ 6 (1985); Radiodetermination Satellite Service, 58 RR 2d 1416, 1418 ¶ 5 (1985). Requiring LEO satellite technology in the 1.6/2.4 MHz bands would promote this goal by providing diverse competition for the Commission's only existing MSS system and not allowing AMSC to further advance its current monopoly on MSS in the United States.

b. Economic Benefits of LEOs. The Commission noted that implementation of LEO MSS systems could help the United States economy by expanding international markets for United States goods and services and enhancing United States competitiveness through development and implementation of new technologies. NPRM, ¶ 21. The Commission has long recognized that the United States' leading role in the development of communications satellite technology has yielded significant economic and trade benefits in the international economy. The Commission has consistently sought to sustain and expand this leading role as a central goal in its satellite communications proceedings. See International Satellite Systems, 101 FCC 2d 1046, ¶ 41 (1985) (subsequent history omitted); cf. Statement of Chairman Hundt before the Senate Subcommittee on Commerce, Justice, State and